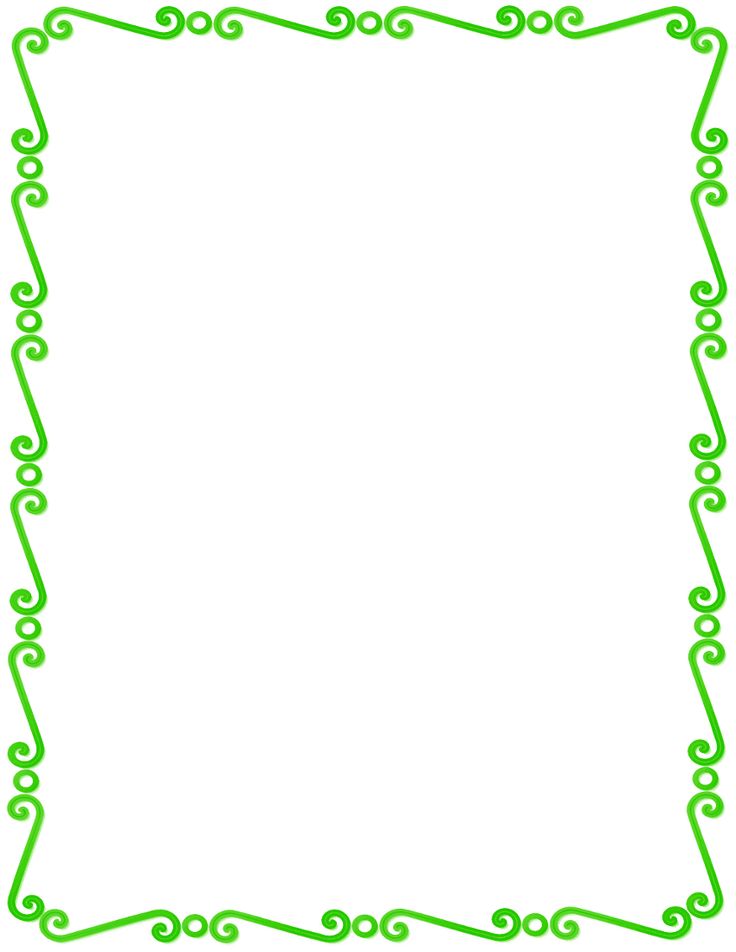
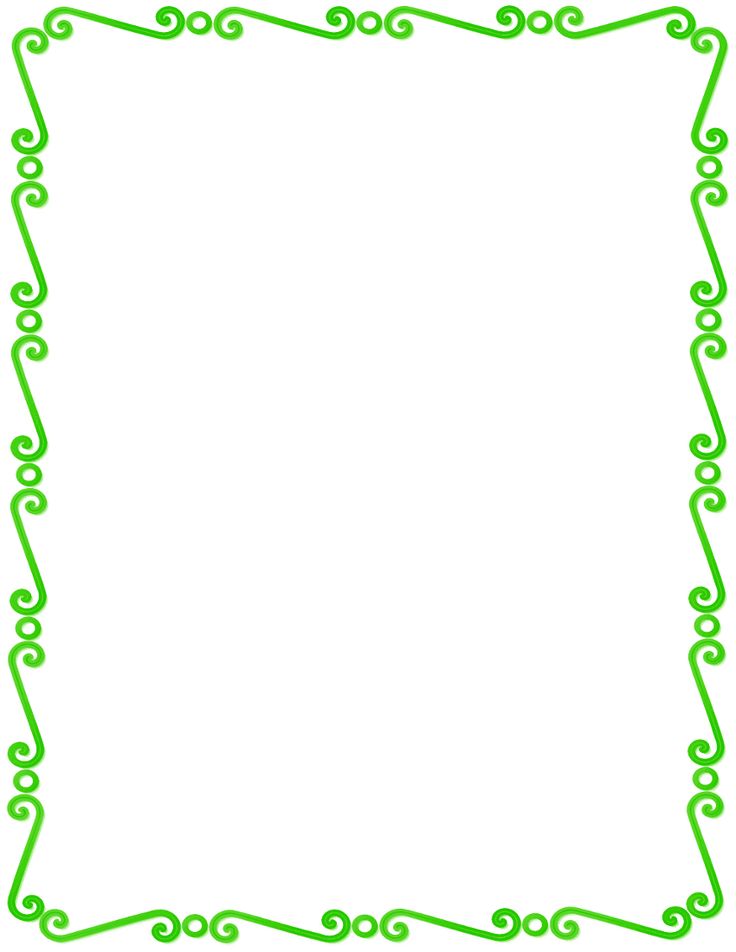
**[](http://www.tattoodonkey.com/free-clip-art-borders-frames-page-dividers-tattoo/wpclipart.com*page_frames*spiral_border*green_spirals_border.png/)**Chapter 9 Developing Meanings for the Operations

By: Andreia Ortega, Nimita Chaucan, Clare Beatty, and Nickki Virgilio

Big Ideas:

1. Addition can be thought of as physically or conceptually placing two or more quantities together.
2. Subtraction can be thought of as taking an amount away from a given quantity, comparing two quantities, or finding a missing part given the whole and the other part.
3. Multiplication in grades pre-K -2 involves counting groups of equal size and determining how many are in all.
4. Division in grades pre\_k-2 can be thought of as sharing equal amounts among a given number of groups or as repeatedly measuring out the same amount from a given total
5. The operations are related to each other. Addition names the whole in terms of the parts, and subtraction names a missing part. Multiplication can be thought of as repeated addition. Division names a missing factor in terms of the known factor and the product. Division can also be thought of as repeated subtraction.
6. Models can be used to solve contextual problems for all operations and to figure out what operations is involved in a problem. Models also can be used to give meaning to number sentences.

Key terms

* Operation sense: children connect different meanings, interpretations, and relationships to the four operations of addition, subtraction, multiplication and division so that they can accurately and fluently apply these operations in real-world settings.
* Join/Add to Problems: Join problems describe situations in which quantities are physically being brought together, these problems are also known as add to problems because the action or change occurring in the problem is a result of adding or joining quantities.
* [](http://www.tattoodonkey.com/free-clip-art-borders-frames-page-dividers-tattoo/wpclipart.com*page_frames*spiral_border*green_spirals_border.png/)Separate/Take Problems: separate problems are commonly known as take away or take from problems in which part of the quantity is physically being removed or taken away.
* Contextual Problems: are the primary teaching tool that you can use to help children construct a rich understanding of the operations.
* Part-Part-Whole Problems: part-part-whole problems, also known as put together and take apart problems in CCSS, involve two parts that are conceptually or mentally combined into one collection of whole.
* Comparison problems: comparison problems involve comparing two quantities.
* Count All Strategy: when a child who is working at the direct modeling level would count out 5 blocks, then count out 8 more blocks, and then count them all to find 13.
* Commutative Property: sometimes known as the order property, for addition says that it makes no difference in which order two numbers are added.
* Computational Fluency: related to their number skills are the many different methods that children will develop for computing. Place-value ideas will be enhanced and utilized as children find new and better ways to break numbers apart and combine them. The structure of the problem can significantly influence the way children compute.
* Up and Over 10 Strategy: when a child reasons that because 8 is 2 away from 10, he can decompose 5 into 2 and 3, add the 2 to the 8 to get 10, and then add 3 more to get 13.